Exceptional service in the national interest

Sandia National Laboratories

The 2014 PV Distribution System Modeling Workshop: Welcome and Purpose

Robert Broderick, MSEE, P.E.

Sandia National Laboratories, Albuquerque, NM

May 6, 2014 Santa Clara, CA

SAND 2014-4477C

U.S. DEPARTMENT OF ENERGY | NNSA National Nuclear Security Administration

Sandia National Laboratories is a multi-program laboratory managed and operated by Sandia Corporation, a wholly owned subsidiary of Lockheed Martin Corporation, for the U.S. Department of Energy's National Nuclear Security Administration under contract DE-AC04-94AL85000.

WIFI ACCESS

Sandia National Laboratories

- Connect to “biltmore-mr02” or “biltmore-mr02-5G”
  - Password: cloudysocks236

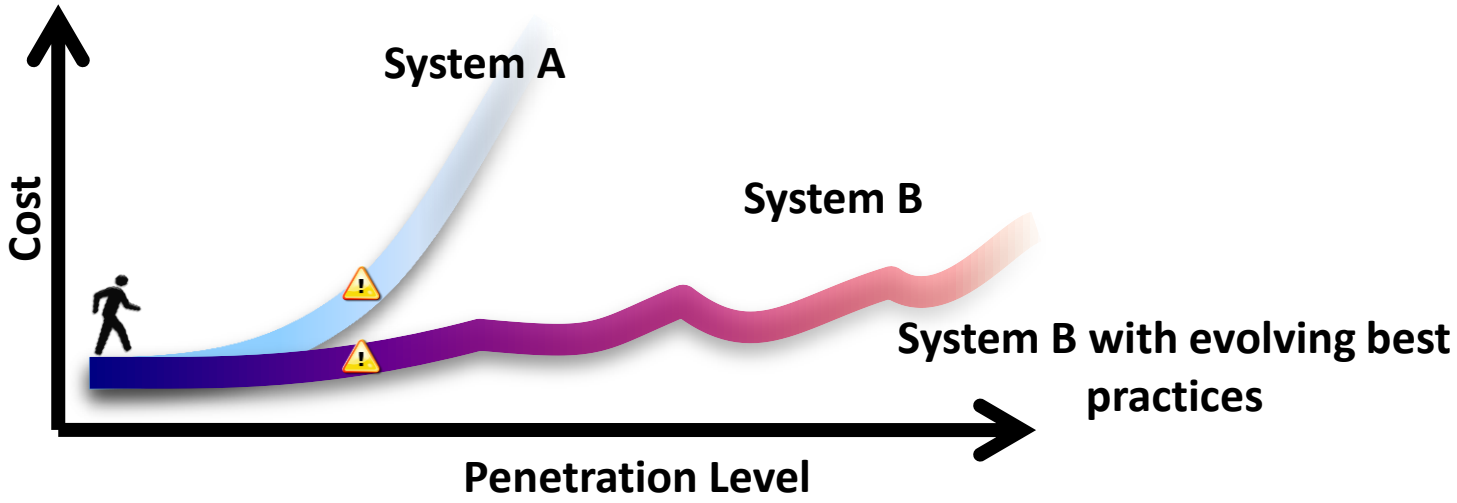
2014 PV Systems Symposium

Sandia National Laboratories

2014 PV Systems Symposium Events

- May 5: PV Performance Modeling Workshop
- **May 6: PV Distribution Modeling Workshop**
- May 7: PV Operations and Maintenance Workshop (EPRI Headquarters)
- May 7: EPRI Smart Inverter Workshop (Biltmore)
- May 8: ASTM International subcommittee E44.09 Photovoltaic Electric Power Conversion (EPRI Headquarters)

Grid Integration Challenge



- An important measure of success for the DOE SunShot initiative will be the amount of solar generation that can be cost-effectively and reliably installed on the grid by 2020.
- A critical barrier to grid integration is the inability of current interconnection screens to adapt to the proliferation of high PV deployment scenarios and differentiate high risk interconnections from those not needing interconnection studies.
- Understanding and modeling high PV deployment scenarios and their impacts on the electric distribution system and mitigating the impacts with cost effective and reliable solutions.

4

History of the Distribution System Modeling Workshops

Sandia National Laboratories

- The 1st Distribution System Modeling Workshop was held in La Jolla, CA July 2012 sponsored by NREL, Sandia and EPRI.

- 2nd Distribution System Modeling Workshop was to be held in Portland in October 2013 but was cancelled due to government shutdown.

Gaps Identified

Sandia National Laboratories

Gaps and next steps identified in the La Jolla workshop:

1. How to model the grid of the future that utilizes advanced control strategies?

2. What are the guidelines/best practices for implementing advanced control functions on the distribution system?

3. How to provide accurate models, tools and data resources for use by utility engineers and consultants to efficiently analyze interconnection impacts and mitigate them cost effectively?

2014 Workshop Program

- *8:15 - 10:00 AM*: **Current Interconnection and Screening Practices (rules of the road)**
- *10:15 - 12:00 PM*: **Advanced Inverters: Capabilities and Functionality (future pathways)**
- *12:15-1:15*: **Working Lunch**
- 1:15-3:00: **Details for Using Advanced Inverters in DER Applications (deep dive)**
- *3:15- 5:15 PM*: **Modeling Challenges to Consider for Advanced Inverters (implementations)**
- *5:30-6:30 PM*: Buffet Dinner offered by Biltmore ($20?)
- *7-9 PM*: Special Evening ("Traffic Buster") Session on Modeling Software Updates and IEA-PVPS Task 14 update.

Agenda Updates

11:50 AM	Discussion	*All*
12:00 PM	**Lunch Break**	
12:15 PM	**Working Lunch**	
	Transmission Perspective: LVRT and FRT	*Abe Ellis SNL*
	Interconnection Standards in California: A Regulatory Approach to a Fast-Changing Grid	*Rachel Peterson, CPUC*
	Modeling Effective Grounding for Grid Tied Inverters.	*Taylor Hollis, Schneider Electric*
1:15 PM	**Details for Using Advanced Inverters in DER Applications (deep dive)**	
	Advanced Inverter Setting Specifications	*Jay Johnson, Sandia*
	Communications and control – Autonomous and Central Control	*Bill Reaugh, KACO new energy*
	Optimization Hosting Capacity with AI Functions	*Matt Rylander-EPRI*
	Interaction and Coordination with EPS	*Robert Broderick for Chase Sun,*

EPRI-Sandia PV Systems Symposium – PV Distribution Systems Modeling Workshop Agenda (draft)

Sandia National Laboratories NREL NATIONAL RENEWABLE ENERGY LABORATORY EPRI ELECTRIC POWER RESEARCH INSTITUTE

	Equipment	*PG&E*
2:50 PM	Discussion	*All*

Thank You!

Sandia National Laboratories

rbroder@sandia.gov

http://solar.sandia.gov

http://PV.sandia.gov